

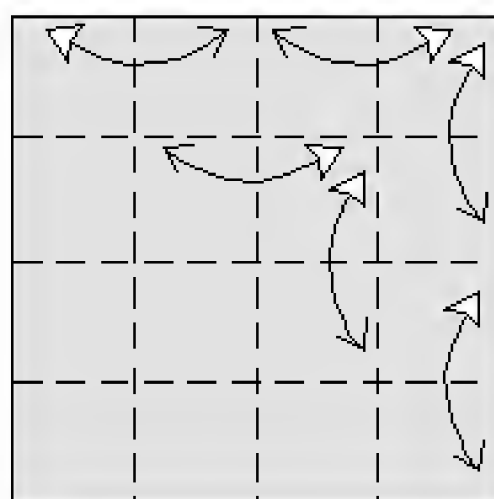
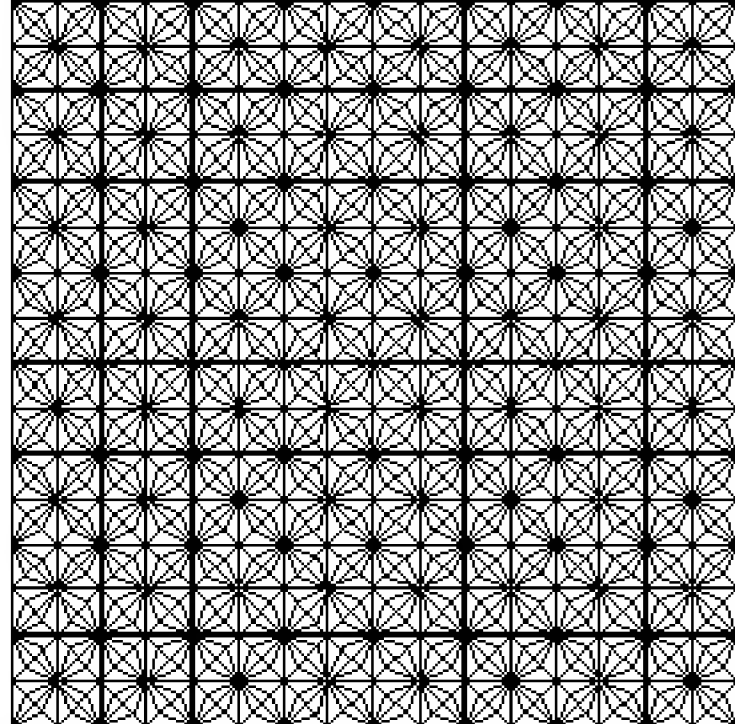
145 point sea urchin

by Toshiyuki Meguro (Japan) © 1990

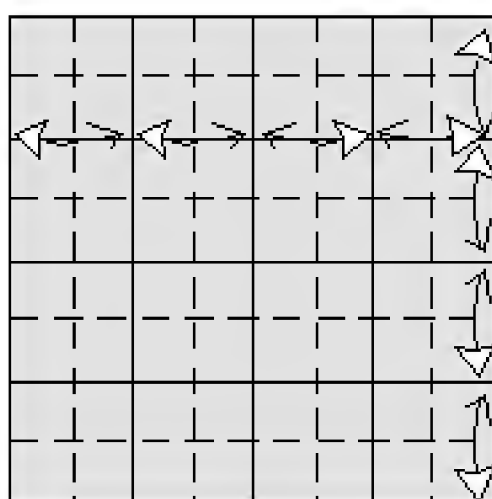
Diagrams and folding method by Hans Birkeland
© 1994

Use thin paper that doesn't tear easily.
The size should be at least 40 x 40 cm.
Begin with the dark side up.

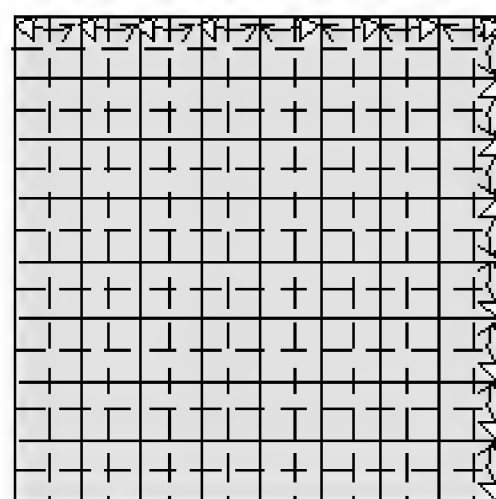
Folding pattern :



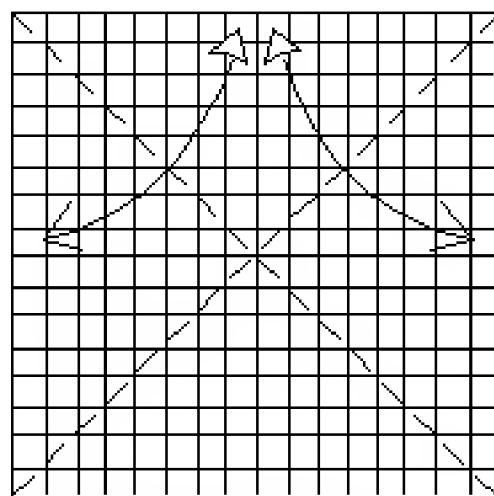
1. Crease the paper into fourths vertically and horizontally.



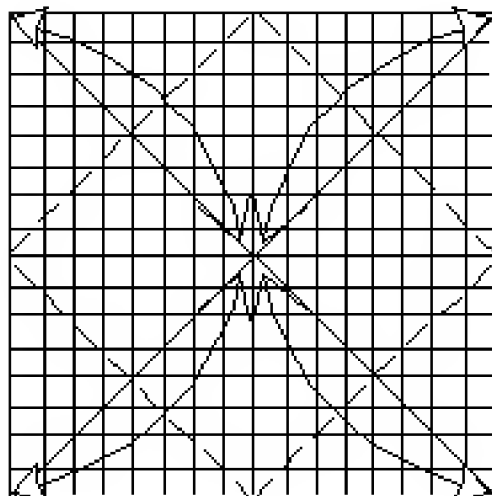
2. Crease the paper into eights vertically and horizontally.



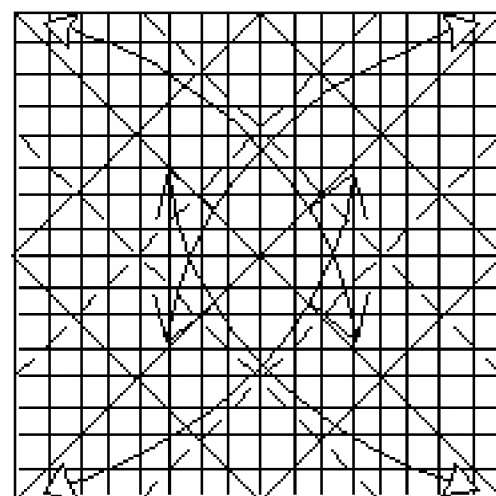
3. Crease the paper into sixteenths vertically and horizontally. Turn the paper over.



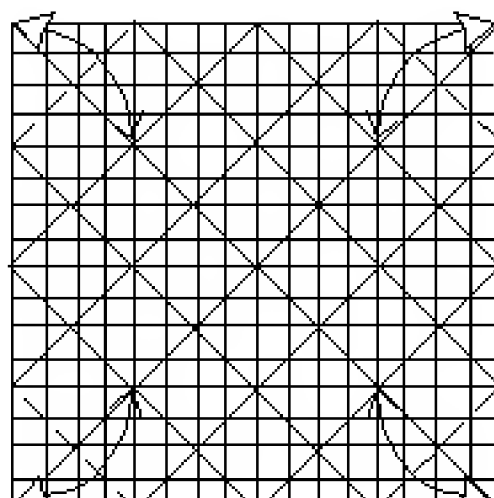
4. Crease the diagonals.



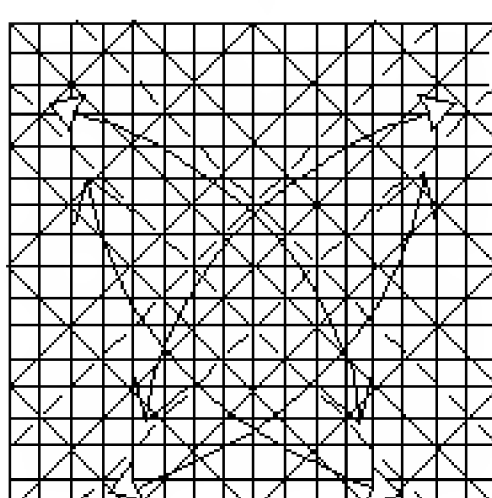
5. Bring the corners to the center, crease, and unfold.



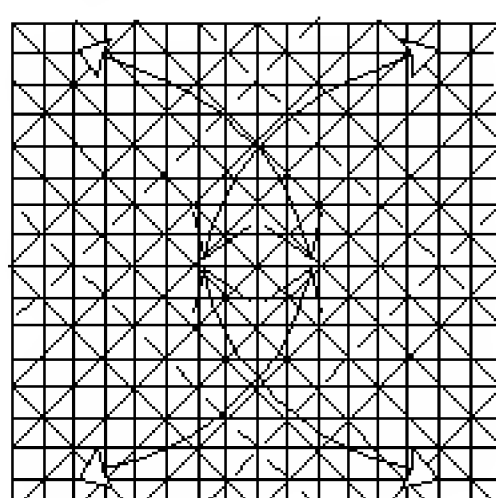
6. Add more diagonal creases.



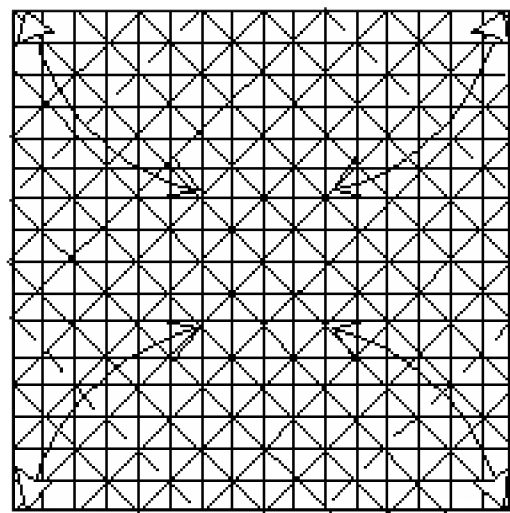
7. And more.



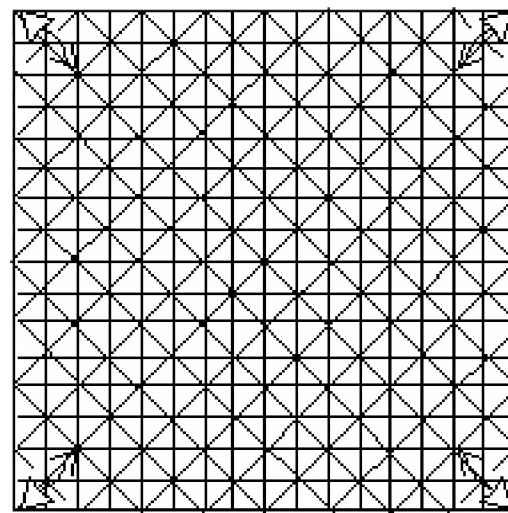
8. And more.



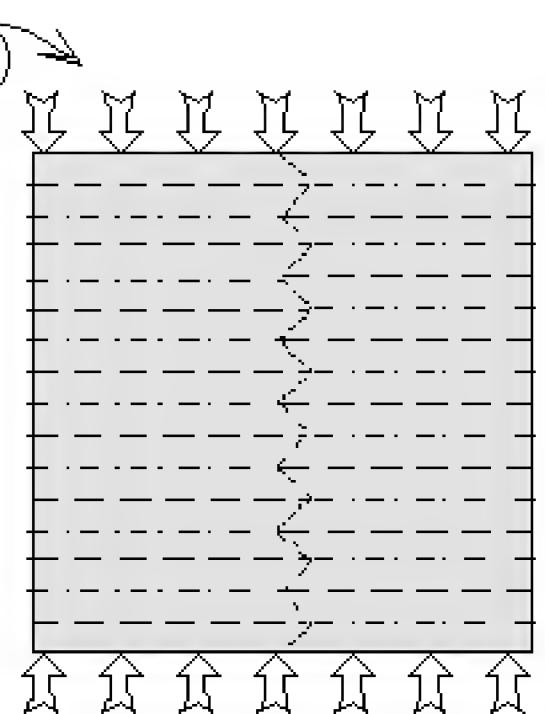
9. And more.



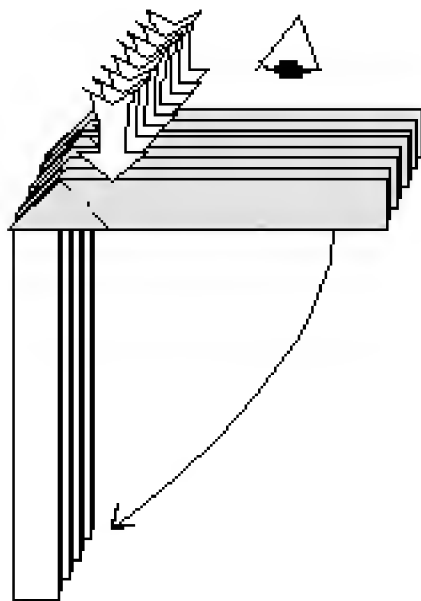
10. And more.



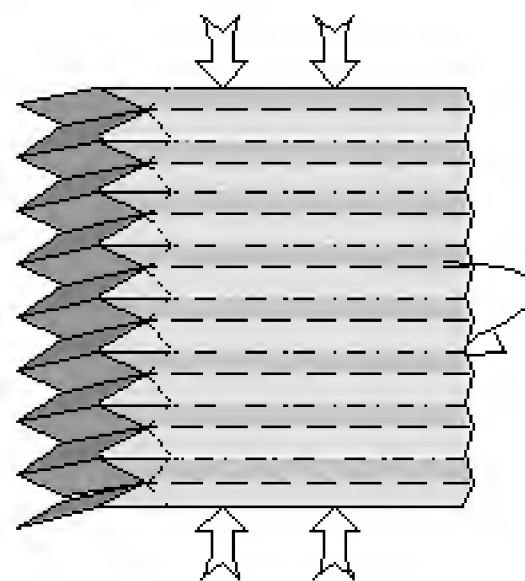
11. And more.
Turn the paper over.



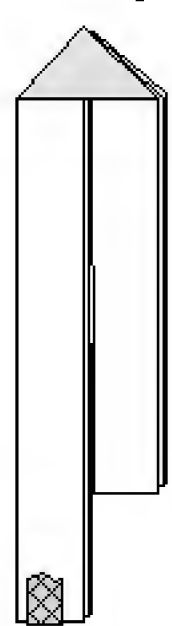
12. Collapse on existing creases.



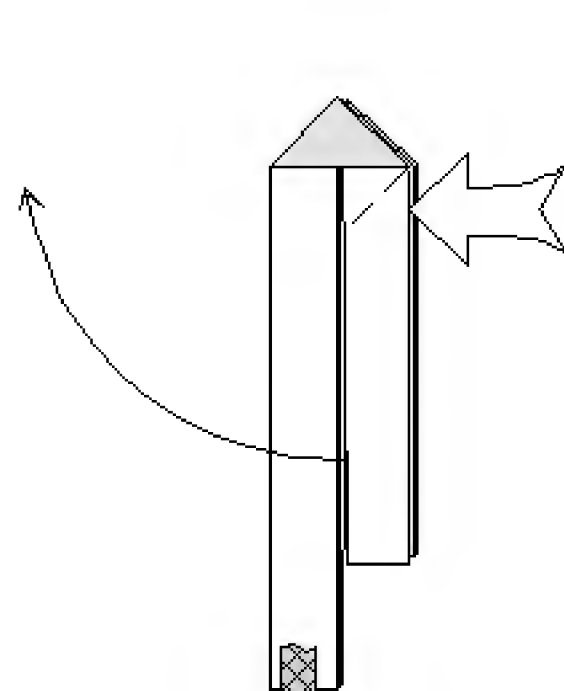
13. Reverse-fold all eight edges on existing creases. The easiest way to do this is to spread out the paper and reverse the creases that make up the fan (see step 14) before collapsing.



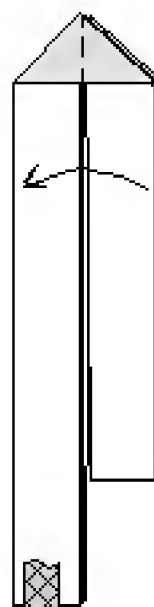
14. Step 13 seen from above.



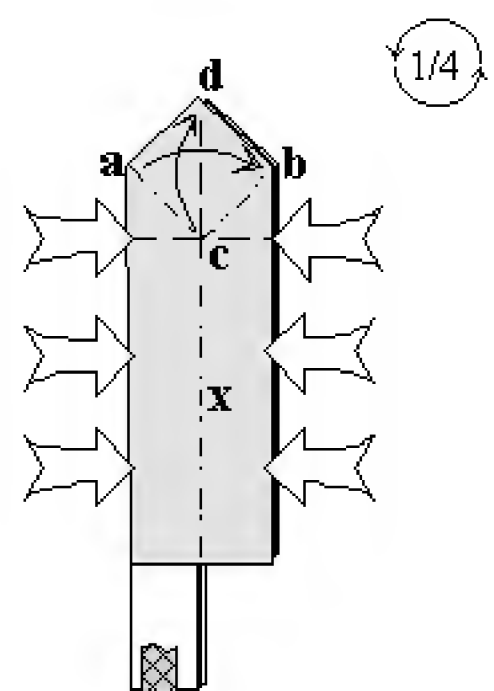
15. To make the following steps easier to perform, put a piece of tape at the bottom of the long assembly to keep the layers together.



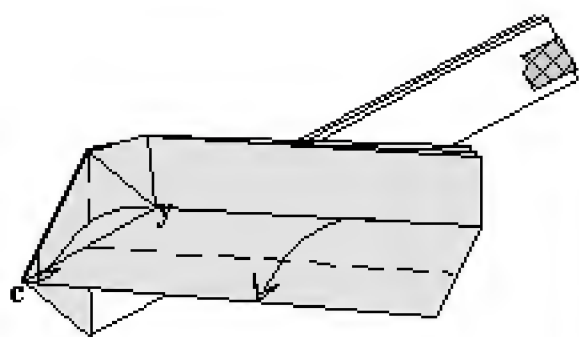
16. Continue reverse-folding on existing creases. This time it's a bit more difficult, because the model can't be opened out as in step 13/14. The process is described in more detail in steps 17-20.



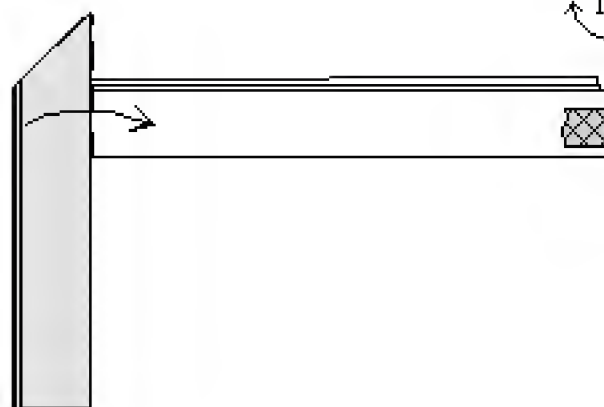
17. Bookfold one layer to the left.



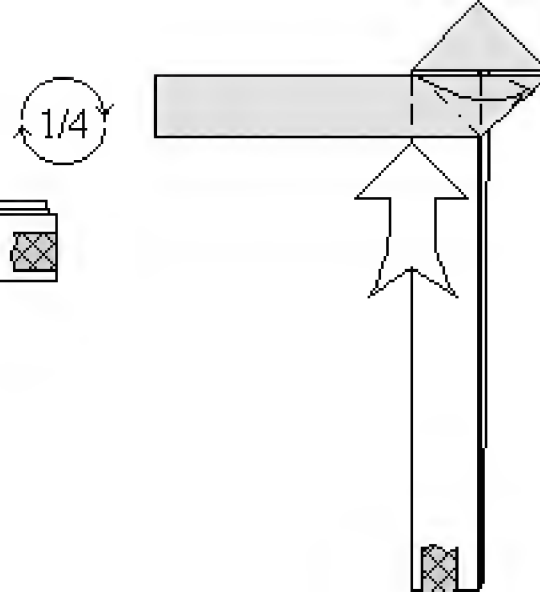
18. Make the edge (x) stand out by pushing in the sides of the nearest layer. Then swing corner (a) to the right to meet corner (b), and let corner (c) meet corner (d). The model is now 3-D. Rotate the model 1/4 turn counter-clockwise.



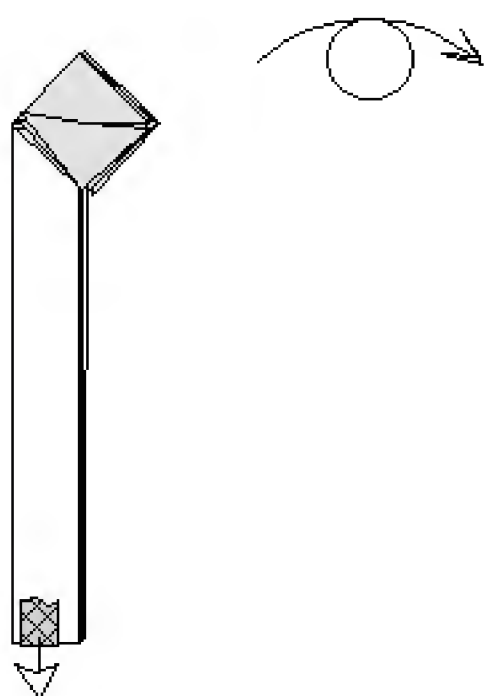
19. Closed-sink corner (y) outward so that it meets corner (c). Repeat with the next 6 similar corners.



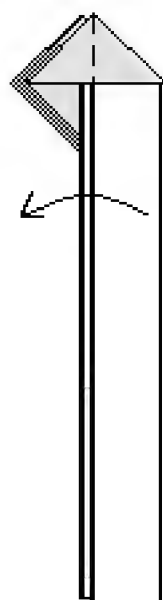
20. Book-fold the assembly to the right. Rotate the model $1/4$ turn clockwise.



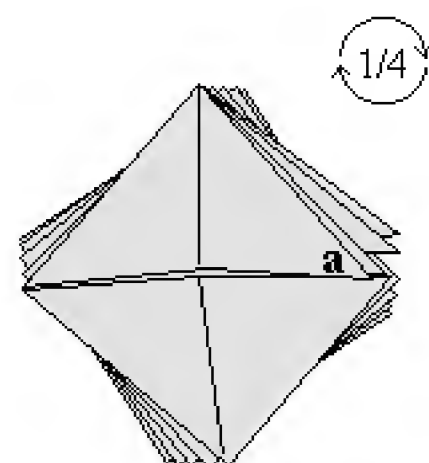
21. Repeat steps 18-20, pretending that you already have book-folded a layer to the left. Be careful and do not rush: this process is quite difficult! It is important that you only use existing creases. Notice that the model starts resembling a spiral. Continue reverse-folding, repeating steps 17-20 /18-20 every second turn until there is no paper left.



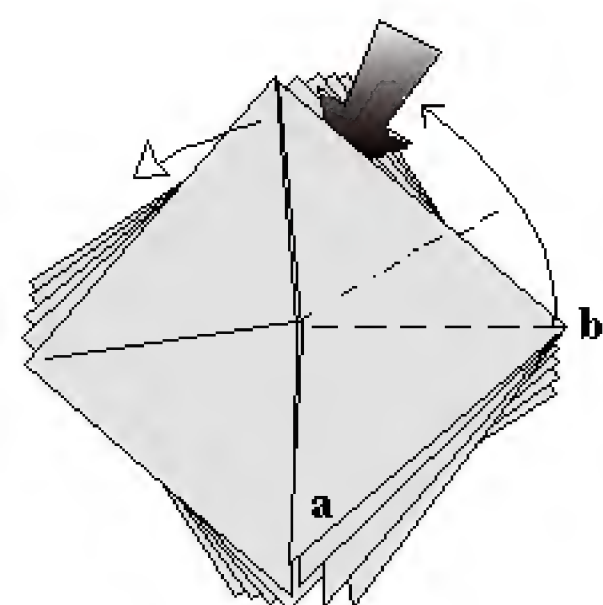
22. Like this. Now take off the tape and turn the model over.



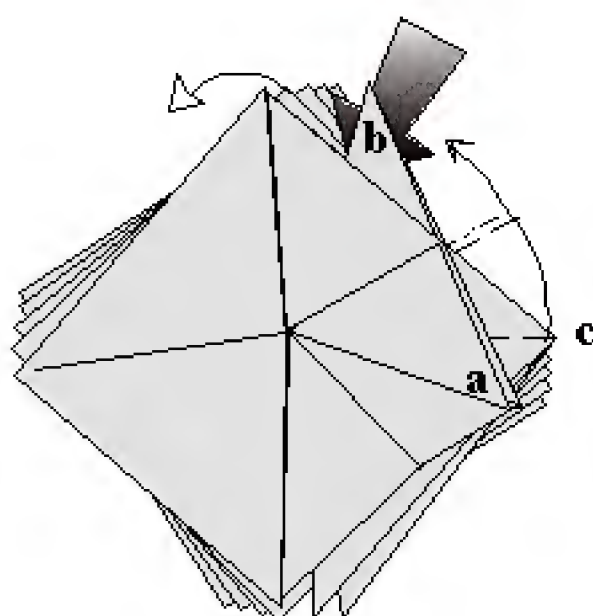
23. Repeat the process from steps 17-21 on the other long assembly.



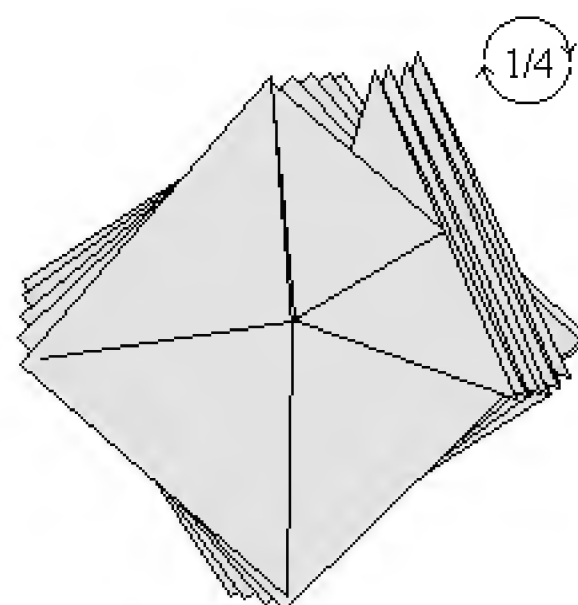
24. Like this. Rotate the model $1/4$ turn clockwise so that the end of the spiral (a) points downward.



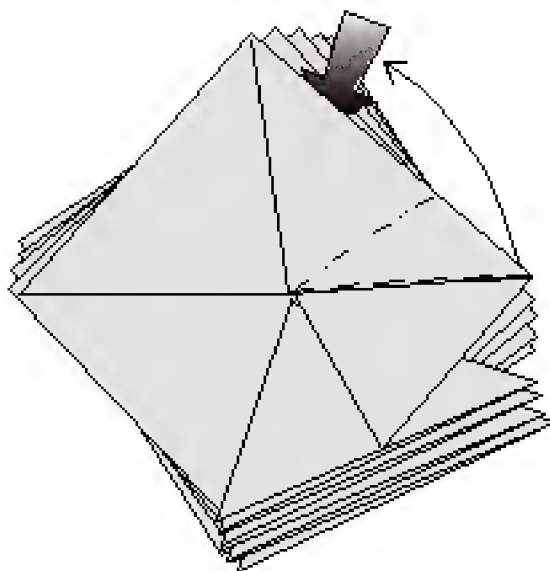
25. Open out one layer at the top, press together the two edges below corner (b) and swivel upward. Then press flat.



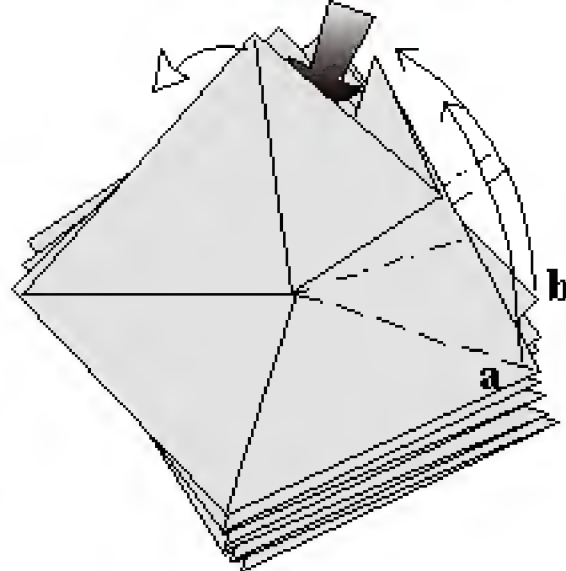
26. Open out two layers at the top, press together the two edges below corner (c) and repeat the process from step 24. Then continue swivel-folding the next six corners. In the next drawing, only four of the eight corners are shown.



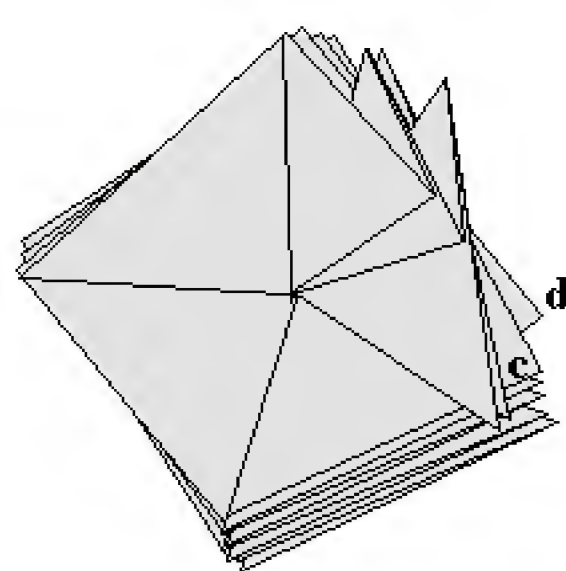
27. Rotate the model $1/4$ turn clockwise.



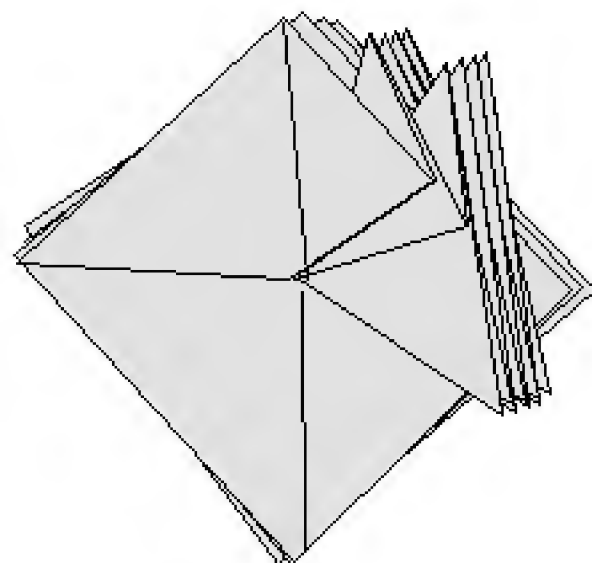
28. Swivel-fold the nearest layer.



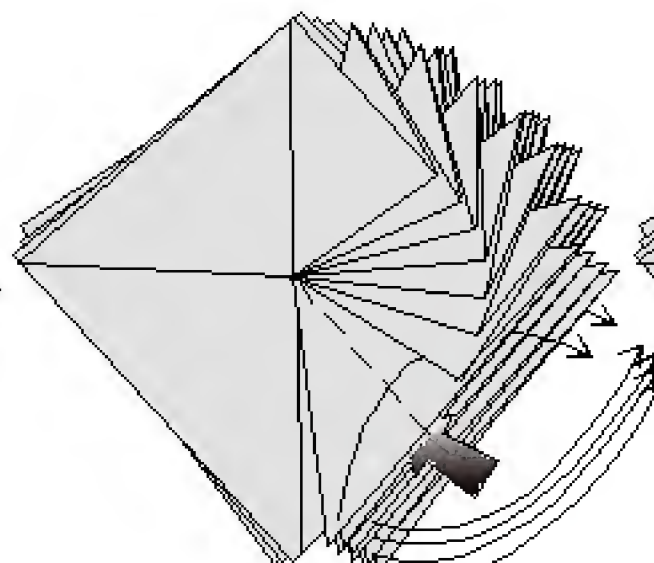
29. Open out one layer at the top and swivel-fold corner (a) and (b) together.



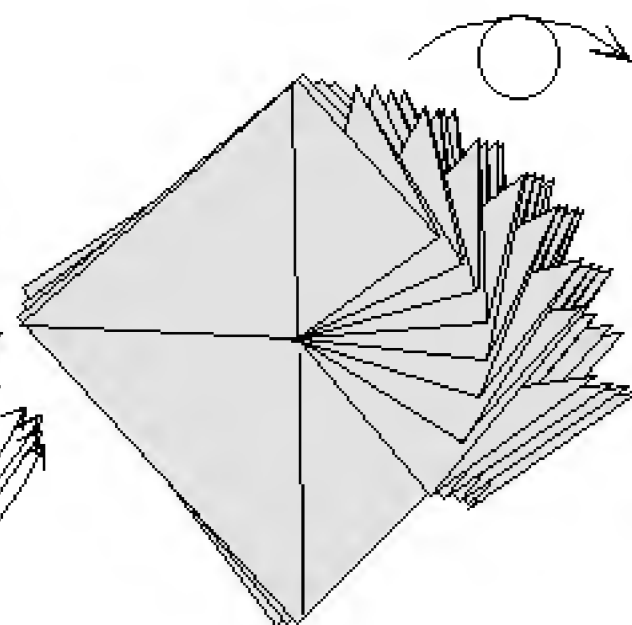
30. Repeat the process with corner (c) and (d) and then continue until there are eight points on the lower row and nine on the upper (the last corner on the upper row will be folded as in step 28).



31. Repeat steps 27-30, with the only difference that now the old points will follow the new ones in the swivel-process. Then repeat steps 27-30 on the three next groups of corners.



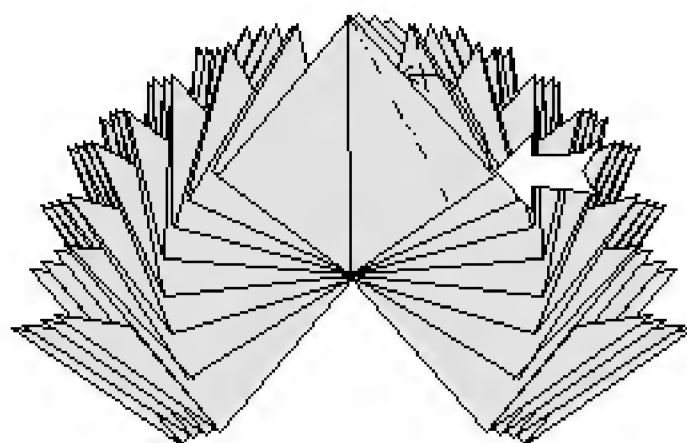
32. Valley-fold the nearest edge upward and put it underneath the next edge. Repeat behind. Reverse-fold the seven corners in between.



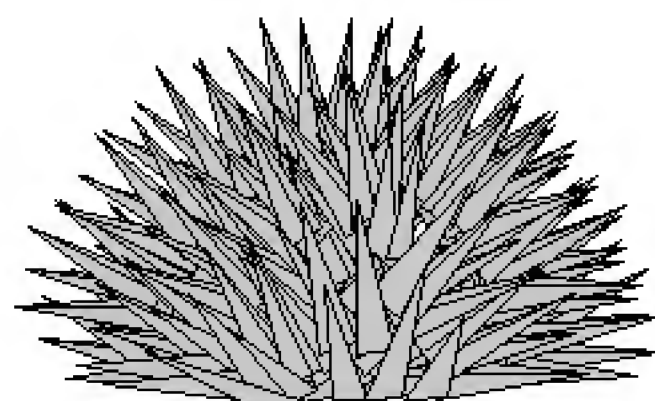
33. Turn the model over and repeat steps 25-32. In the next step, a part of the model is seen from the side.



34. The layers between the points might get out of order. This is how they should be arranged.



35. Narrow all the points with reverse-folds, starting on the top, and taking a row at the time. Each reverse-fold narrows an edge that connects two points. It might be helpful to use tweezers. When you're finished, spread out the points to make the model 3-dimensional.



36. The finished 145-point sea urchin.